

CLAIMS

What is claimed is:

1. A method for determining a highest level signal name in a hierarchical circuit design, comprising:
 - tracing a signal path into a hierarchically lower level of the circuit design from a predetermined net in the circuit design to a predetermined terminal instance, while adding indicia, to an instance history list, of each subsequent instance encountered in the tracing step;
 - determining a port instance on the terminal instance associated with a selected net for which the highest level signal name is to be determined;
 - designating, as the current net, the selected net, and
 - for each stored indicia in the instance history list:
 - determining the net connected to the current net in a hierarchical parent of the instance identified by the indicia, to establish a next current net; and
 - if a condition exists wherein there is no connection from the current net to a hierarchically higher level instance, then establishing the current net as the highest level signal name for the selected net.
2. The method of claim 1, wherein the current net is established as the HLSN for the selected net if there is no net connected to the port instance that is located on the instance within which the current net exists.
3. A method for determining a highest level signal name (HLSN) for a selected net in a hierarchical circuit design, comprising:
 - tracing a signal path from a net in an instance in the design to a terminal instance in a hierarchically lower level of the design;
 - storing, in an instance history list, indicia of each instance encountered during the tracing step;
 - repeating the steps of tracing and storing until a predetermined trace endpoint is encountered;

determining, for the selected terminal instance, a selected port instance for
 which the HLSN is to be determined;
 determining a current net on the selected port instance;
 determining the port connected to the current net;
 removing, from the instance history list, the most recently stored indicia;
 determining, as a next port instance, the port instance on the instance
 identified by the most recently stored indicia that is an instantiation of
 the port connected to the current net;
 determining, as the current net, the net connected to the next port instance; and
 repeating the previous four steps until a retrace endpoint is encountered to
 establish the current net as the HLSN for the
 selected port instance.

4. The method of claim 3, wherein the retrace endpoint is encountered when the instance history list is empty.

5. The method of claim 3, wherein the retrace endpoint is encountered when there is no connection from the current net to a hierarchically higher level instance.

6. The method of claim 3, wherein the retrace endpoint is encountered when there is no net connected to the port instance that is located on the instance within which the current net exists.

7. The method of claim 3, further comprising generating the HLSN for the selected net by concatenating, with the name of the current net, the names of each instance indicated in the instance history list.

8. A method for determining a highest level signal name (HLSN) for a selected net in a hierarchical circuit design comprising:

selecting a first port instance on an initial net;
 performing a trace operation comprising the steps of:
 determining the owning instance for the first port instance;

storing indicia of the owning instance, as a stored instance, in an instance history list;
determining a next net connected to the port on the describing block of the owning instance;
using the next net as the initial net for a next iteration of the trace operation;
and
selecting a new first port instance on the initial net;
repeating the trace operation if the owning instance is not a predetermined trace endpoint;
determining a selected port instance for which the HLSN is to be determined;
determining a current net on the selected port instance; and
performing a retrace operation comprising the steps of:
determining the port connected to the current net;
removing, from the instance history list, the most recently stored indicia;
determining, as a next port instance, the port instance on the instance identified by the most recently stored indicia that is an instantiation of the port connected to the current net;
determining, as the current net, the net connected to the next port instance; and
repeating the retrace operation until a retrace endpoint is encountered wherein:
the instance history list is empty;
there is no connection from the current net to a hierarchically higher level instance; or
there is no net connected to the port instance that is located on the instance within which the current net exists;
and
establishing the current net as the HLSN for the selected net.

9. The method of claim 8, further comprising generating the HLSN for the selected net by concatenating, with the name of the current net, the names of each instance indicated in the instance history list.

10. A system for determining a highest level signal name (HLSN) for a selected net in a hierarchical circuit design, comprising:

- a processor, coupled to a storage unit containing the hierarchical circuit design, and to computer memory;
- an instance history list stored in the computer memory;
- a path trace module, stored in the computer memory, executable by the processor to analyze the hierarchical circuit design to determine the HLSN for the selected net by:
 - tracing signal path into a hierarchically lower level of circuit design from a predetermined net in the design to a predetermined terminal instance, while adding indicia, to the instance history list, of each subsequent instance encountered during the tracing;
 - determining a port instance associated with the selected net for which the HLSN is to be determined;
 - designating, as the current net, the selected net, and
 - for each stored indicia in the instance history list:
 - determining the net connected to the current net in a hierarchical parent of the instance identified by the indicia, to establish a next current net; and
 - if a condition exists wherein there is no connection from the current net to a hierarchically higher level instance, then establishing the current net as the highest level signal name for the selected net.

11. The system of claim 10, wherein the current net is established as the HLSN for the selected net if there is no net connected to the port instance that is located on the instance within which the current net exists.

12. A system for determining a highest level signal name (HLSN) for a selected net in a hierarchical circuit design, comprising:

- means for tracing a signal path from a net in an instance in the circuit design to a terminal instance in a hierarchically lower level of the design;
- means for storing, in an instance history list, indicia of each instance encountered by the means for tracing;

wherein the tracing and storing operations are repeated until a predetermined trace endpoint is encountered;

means for establishing a current port instance, within the terminal instance, for which the HLSN is to be determined, and for designating, as the current net, the selected net; and

means for performing a retrace operation comprising:

- determining the net connected to the current net in a hierarchical parent of the instance identified by the indicia, to establish a next current net; and
- establishing the current net as the HLSN for the selected net;

wherein the retrace operation is performed for each stored indicia in the instance history list until a retrace endpoint is encountered.

13. The system of claim 12, wherein the retrace endpoint is encountered when the instance history list is empty, or if a condition exists wherein there is no connection from the current net to a hierarchically higher level instance.

14. A software product comprising instructions, stored on computer-readable media, wherein the instructions, when executed by a computer, perform steps for determining a highest level signal name in a hierarchical circuit design, comprising:

- instructions for tracing a signal path into a hierarchically lower level of circuit design from a predetermined net in the circuit design to a predetermined terminal instance, while adding indicia, to an instance history list, of each subsequent instance encountered during tracing;
- instructions for determining a port instance associated with a selected net for which the highest level signal name is to be determined;
- instructions for designating, as the current net, the selected net; and
- for each stored indicia in the instance history list:
 - instructions for determining a current net on the current port instance;
 - and
 - instructions for determining a next current port instance on the last

instance that is an instantiation of the port connected to the current net;
and
if a condition exists wherein there is no connection from the current net
to a hierarchically higher level instance, then instructions for
establishing the current net as the highest level signal name for
the selected net.

15. The software product of claim 14, wherein the current net is
established as the HLSN for the selected net if there is no net connected to the port
instance that is located on the instance within which the current net exists.